

REMARKS

By way of this communication applicants have amended claim 1 by limiting the process to one wherein a so-called "ribbon" nanofiber structure if produced. That is, one comprised of separate non-continuous graphite sheets. This was the subject of claim 2, which has been canceled. Applicants have also canceled claim 3 because it is not consistent with a "ribbon" nanofiber structure.

Rejection under 35 U.S.C. 103(a)

Claims 1-19 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the Baker et al. article, pages 254-255 in particular, for making carbon nanotubes from CO and H₂ using a powder catalyst that could be Fe or Fe:Cu.

Examiner's Position

It is the Examiner's position that the Baker et al. article differs in the temperature, however the 600° used is deemed to be obvious from the claims in view of the variation of "about" and further noting that using a higher temperature than taught is an obvious measure to speed the reaction rate.

The Examiner further comments that as for claims 2,3,13 and 14 the structures appear depicted and no difference is seen in the product due to the similarity of the process steps.

Applicants' Position

It is applicants' position that the Baker et al. article does not teach a process for producing a "ribbon" type of graphite nanostructure. That is, one that is comprised of separate non-continuous graphite sheets that are substantially parallel to the longitudinal axis of the nanostructure. The Baker et al. article teaches the production of either graphite nanotubes wherein the graphite sheets are oriented substantially parallel to the longitudinal axis of the nanotube but wherein the sheets are connected (not separate) to form a multifaceted tubular

structure or wherein the sheet is tubular in shape to form a substantially cylindrical nanotube. The other nanostructures taught in the Baker et al. article are graphite nanofibers wherein the graphite sheets are oriented either perpendicular or at an angle (herringbone) to the longitudinal axis of the nanofiber. There is no teaching or suggestion in the Baker et al. article that a so-called "ribbon" nanostructure can be produced. The nanotubes taught in the Baker et al. article are produced from the interaction of an Fe powder catalyst supported on carbon when heated in a C₂H₄/CO/He mixture at 600°C. The currently claimed process for producing "ribbon" type graphite nanostructures comprises the decomposition of a mixture of CO/H₂ over Fe, Fe:Ni or Fe:Cu catalysts at temperatures from about 625° to 725°C.

Therefore, in view of the above, it is requested that the Examiner reconsider and withdraw this rejection.

Rejection Under 35 U.S.C. 102(b) and 103(a)

Claims 16-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Baker et al.

Examiner's Position

It is the Examiner's position that Baker et al. does not explicitly teach the exact process as instantly claimed, but appears to make the same product. The Examiner continues by saying that where the Examiner has found a substantially similar product as in the applied art the burden of proof is shifted to applicant to establish that their product is patentably distinct.

Applicants' Position

Applicant maintains that the products taught in the Baker et al. article are either graphite nanofibers wherein the graphite sheets are oriented perpendicular to at an angle to the longitudinal axis of the nanofiber, or they are graphite nanotubes. The product that is produced in accordance with the claims, as now amended, are neither nanofibers with graphite sheets oriented perpendicular or at an angle nor nanotubes. They are so-called "ribbon"

nanostructures comprised of separate non-continuous graphite sheets oriented substantially parallel to the longitudinal axis of the nanostructure. As previously mentioned, the currently claimed process for producing "ribbon" type graphite nanostructures comprises the decomposition of a mixture of CO/H₂ over Fe, Fe:Ni or Fe:Cu catalysts at temperatures from about 625° to 725°C.

In view of the above, it is requested that the Examiner reconsider and withdraw this rejection.

Double Patenting Rejection

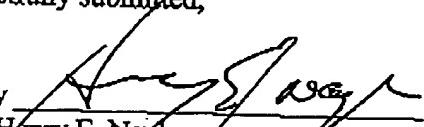
Claims 1-16 are rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,537,515. Although the conflicting claims are deemed not identical, the Examiner believes they are non patentably distinct from each other because the claims overlap in the temperature range.

Applicants submit herewith a Terminal Disclaimer over U.S. Patent No. 6,537,515. Therefore, applicants request that this rejection also be withdrawn.

In view of the above, it is applicants' position that claims, as now amended, define a patentable invention over the cited art. It is requested that the Examiner pass this application to allowance. The Examiner is encouraged to call applicants' attorney should he have any questions regarding this response.

Respectfully submitted,

By


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